REPORT OF THE ADVISORY PANEL

ON

ENVIRONMENTAL HYPERSENSITIVITY

SEPTEMBER 1986

September 8, 1986

Mr. R. Reid
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Institutional Health
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Dear Mr. Reid:

ADVISORY PANEL ON ENVIRONMENTAL HYPERSENSITIVITY

Enclosed with this letter is a report prepared by the Advisory Panel established by the Ministry of Health and on which I sit as Chairman.

The Advisory Panel reviewed the report of the Ad Hoc Committee on Environmental Hypersensitivity Disorders. Under the Chairmanship of Judge G. M. Thomson, the Ad Hoc Committee reported to the Ministry of Health in August, 1985. Based on a series of hearings and submissions from the public, the Panel formulated thirty recommendations on the subject of Environmental Hypersensitivity ("E/H"), a colloquial term used to describe a compendium of disorders which remain poorly defined at present.

The Advisory Panel met on several occasions, and gave careful consideration to the recommendations of the Ad Hoc Committee. The commentary and further recommendations of the Advisory Panel follow in this report.

...2

INTRODUCTION

The Advisory Panel conducted a careful review of the Report of the Ad Hoc or Thomson Committee, and was impressed with the thoroughness with which the Committee had conducted its investigation and provided its conclusions and recommendations - the overall content of the report dealing with this difficult subject was considered excellent. The consensus of the Advisory Panel was that the report had been prepared in a very comprehensive manner. The Advisory Panel strongly supports a scientific approach to medicine which, properly done, can be both humane and rigorous.

The Advisory Panel also agrees with the Thomson report's conclusion that given the number of new chemicals and pollutants being added to our environment yearly, the likelihood of ill effects on human health is high. This is a matter for grave concern and clearly warrants study.

The Advisory Panel reviewed the definition of E/H, and gave consideration to the evidence that could support the postulate that environmental agents could create the symptoms grouped under "E/H". Unfortunately, the evidence is at present either inconclusive or fragmentary. The Advisory Panel decided that the initial effort should be directed towards scientific investigation of these conditions within Ontario before attempting to establish a major treatment facility using current diagnostic and therapeutic modalities.

The Advisory Panel was able to compare and contrast the Thomson report with the recent review of Clinical Ecology published by the California Medical Association Scientific Board Task Force on Clinical

Ecology entitled Clinical Ecology - A Critical Appraisal. (West. J. Med. 144:239, 1986.)

The Scientific Board Task Force of the CMA was chosen for their expertise in internal medicine, toxicology, epidemiology, occupational medicine, allergy, immunology, pathology, neurology and psychiatry. This expertise is similar to the professional experience of the Thomson Ad Hoc Committee and the current Advisory Panel. The California Task Force did not however "address any political or economic issues but strictly limited itself to a scientific evaluation of the evidence." The Thomson Committee and the present Advisory Panel differ from the California Committee in this respect and were charged with considering socio-political and economic issues. Since the conduct of scientific research is international in scope, the California Task Force Evaluation of the scientific basis for the practice of clinical ecology is applicable to the Canadian situation. However, there are major differences between the United States and Canada in the approach to socio-political and economic issues of medicine. These differences are clearly apparent in comparing the comprehensive Thomson report and the more narrowly based California Medical Association assessment.

The Thomson report attempts to distinguish between a humane response to a socio-economic problem disabling individuals in our society, and a strictly scientific response. The final chapter of the Thomson report (Chapter 8) summarizes what might be termed the "Canadian view of social services" on p255 "Committee members believe that it is important to recognize that the on-going debate about the etiology of the disorder has

obscured the fact that there are a number of persons who are ill, whose condition has not been recognized and who are being poorly served, particularly in their need for support services, because of the existing controversy about the validity of environmental hypersensitivity as a diagnosis." The Thomson report continues "In our recommendations we place a high priority on research designed to establish appropriate diagnoses. In the interim however, people who are sick, especially those who are severely ill, need help, compassion and support as they struggle with their disabling conditions." These statements recognize that there is in Canada a tradition of providing support to members of society who find themselves in difficulty through no fault of their own. The Advisory Panel recognizes the problem with taking a strictly scientific approach to a social problem. It is suggested that, because medical doctors might find themselves compromised by lending support to scientifically invalid or unproven diagnostic tests and therapies, a lay panel be constituted towards examining these questions. We are currently in a period of serious financial restraint, where decisions may need to be made on the best allocation of limited resources. Such questions are as much ethical as medical, and the lay public need to be involved in arriving at consensus.

Nevertheless, from a strictly scientific point of view, it seems difficult to justify the use of limited resources towards tests and therapies that are unproven - that statement is made in a general context applying to both "orthodox" and "unorthodox" medicine.

On balance, while couched in a humane discussion of the issues, the Thomson report suggests that many, if not most tests and therapies applied

by the ecologists remain unproven. In this sense, there is agreement with the evaluation undertaken by the California Medical Association. Both the Thomson report and the California Task Force call for scientific validation of the hypotheses of environmental illness, the tests employed and the therapies recommended.

The Thomson report lists several hypotheses for Environmental Hypersensitivity that could be studied scientifically including:

1) "that some people are genetically predisposed to greater sensitivity to environmental substances,

2) that the immune system can become compromised after a viral infection. (This is a hypothesis that really stems from current research in "orthodox" medicine. There is no question but that such effects occur, e.g. AIDS, but questions remain about the identification of patients whose immune system has been compromised when the illness is less catastrophic than AIDS.)

3) that immune complexes involving different immunoglobulin classes cause pathology, and

4) that there is a feedback loop between the central nervous system, particularly the brain, and the immune system."

The Advisory Panel strongly agrees that such hypotheses could be subjected to proper scientific examination and further that inquisitive

minds, trained in the techniques of science, could ask and investigate many valid and imaginative questions concerning the interaction between environment and human biology.

The Panel disagrees, in part, with two important suggestions made by the Thomson report. The first has to do with the validity of anecdotal reports as stated in the quote from bioethicist, Dr. David Roy (p230). Case reports are the weakest form of medical evidence despite the "sheer volume". Case reports can be used to formulate hypotheses, but for various reasons related to scientific method, they provide the weakest evidence towards cause and effect, which require properly controlled epidemiologic data. The methodology for case-control, cohort or randomized blind trials have been well described. As stated in both the Thomson report and the California Medical Task Force report, such studies do not yet exist in the clinical ecology literature and therefore the definition of environmental hypersensitivity (Chapter 2 and p228), is not scientifically valid. Moreover, the Panel believes that acceptance of this definition as more than a hypothesis arising from the case reports could seriously deter qualified scientists from exploring this problem, and epidemiologists from designing more appropriate studies of such patients toward proving cause and effect. This is indirectly recognized on page 233 in the discussion of prevalence, - "Much of the identification of the disorder is based on diagnostic tests of unproven reliability; that fact alone makes it impossible to make definitive statements about the prevalence of the condition." Properly designed epidemiologic studies need to be done to establish prevalence and test cause and effect relationships.

The Panel supports the calls made in the Thomson report for heightened attention to nutrition and environment in the practice of orthodox medicine, while still keeping pace with the technologic advances in medicine.

The Advisory Panel was struck by how often the practitioners of non-traditional medicine draw the rationale for their therapies from basic science data originating within "orthodox" disciplines. It is difficult to argue with the fact that to date the major advances in population health have originated with public health measures, improved nutrition, etc. At the present time, research advances are being made with the newer more powerful experimental technologies such as molecular biology. This creates a vacuum in which data such as the effects of nutrition or chemicals on the immune system exists in cell culture or, less often, animal models, but there is a gap in the extension of this knowledge to human health. Therefore if a young practitioner in good faith feels that immunology is important to the health of his patients, he or she may be left without direction in the application of the science. It is not surprising then, that individuals will read the basic immunology literature and attempt to apply this information to day-to-day clinical problems. Scientifically however, this is not appropriate without the clinical studies to validate the significance of basic animal or cellular research to the human patient. The fact that such research is not being done is a failure within the "orthodox" medical system that leaves a lacuna to be filled by inappropriate and perhaps harmful speculation.

SUMMARY OF CONCLUSIONS

The recommendations of the Advisory Panel may be summarized as follows:

1. A funding allocation would provide implicit recognition that there is likely to be a credible scientific basis for some of the diseases presently grouped under the heading of E/H. However, at the present time, the scientific support for the mechanisms that have been proposed to underlay the wide variety of dysfunctions are at best hypothetical. Moreover, the majority of techniques for evaluating the patients and the treatment protocols espoused are unproven. Accordingly, before accurate diagnosis and new therapies will be possible for those conditions which do result from environmental insults, there is urgent need for well designed fundamental and clinical research studies. The Advisory Panel strongly believes that one step towards the approach to this problem would be to provide funds for contract research into the adverse effects of environmental pollutants, foods, etc. on human biology, and for investigations which will provide information essential to understanding the postulated mechanisms that might lead to environmentally related disorders.

This research should take place within the structure of an existing agency with an established scientific reputation. Both prospectively and retrospectively, the research should be subject to peer review and the following subspecialties should be represented on the Committee responsible for evaluating the applications:

Pathology

Toxicology/Pharmacology

Behavioural Sciences - especially as it relates to food

Nutrition

Immunology, Allergy

Clinical Epidemiology

Developmental Biology

Clinical Ecology

Neurobiology

The Advisory Panel considered that funds should be provided annually for a period of up to five years in a slowly increasing manner, with the maximum funding reached in the third year and maintained in the fourth and fifth years. In the fifth year of operation, a completely independent body should be requested to review the scientific achievements that have accrued from this process, in order to recommend further development.

2. The Advisory Panel believes it to be premature to embark on an in-patient facility at this time, at least under the guidelines suggested in the Ad Hoc Committee report, where it was recommended that three years of support be provided and then research grants would form the basis for support of such a unit. It is the considered opinion of this Advisory Panel, with considerable practical experience in development of research units and university/hospital departments, that it is highly unlikely that such an in-patient facility would have reached maturity in three years time and would become self-supporting through a research grant base. There are

no precedents in Ontario for the provision of clinical care through a research grant funding mechanism nor the performance of fundamental research through clinical fee generation. Either of these funding strategems would put the unit in jeopardy from the outset and make it unlikely to attract the calibre of personnel necessary for success.

An alternative approach would lay the ground-work for future establishment of a clinical facility with associated research capacity. The successful development of productive research at several universities through the research funding program, and the clarification of the epidemiologic aspects of E/H, would promote interest in the development of an in-patient facility in a university setting. The initial spreading out of programs of research in this field would generate more broadly-based interest throughout Ontario.

Recognizing that the need to send patients to specialized facilities in the United States will continue, and given the difficulty of evaluating the efficacy of these centres, the Advisory Panel concluded that all patients being considered for admission to these US facilities should eventually be referred through an assessment process. As a first step, a lay committee with a broad mandate should be established to undertake a statistical evaluation of the costs of such treatment, and help develop a data base towards analysis of costs. This committee would include an ethicist, a lawyer and a health economist as a minimum. Gradually, as research establishes the nature of this illness, the lay committee could add a professional component and assume responsibility for recommending referral of the patients onward. In the transition period after adding the

professional component but before adopting responsibility for referral, the committee should gather information to evaluate the efficacy and long term result of treatment in an inpatient facility.

Since the scientific basis for the diagnostic tests and treatments recommended by clinical ecologists remains unproven at present, the Advisory Panel agrees with the suggestion made in the Thomson report that research must be done, but that it would be more appropriate for social agencies to be used to provide support for people who are incapacitated while this research is being done.

AD HOC COMMITTEE RECOMMENDATIONS

The Advisory Panel considered each of the thirty recommendations of the Ad Hoc Committee, and provided the following commentary - in several instances the recommendations are grouped, since they deal with related subjects. A precis of each recommendation is provided in quotation marks, followed by a commentary from the Advisory Panel.

Recommendations 1 and 2 - "These recommendations propose further restriction of smoking in public places and the labelling of food chemicals and drugs as to content."

Comment - The Advisory Panel strongly supports these recommendations, and believes that this process should be accelerated, since public acceptance of the availability of additional information would be high.

Recommendation 3 - "Recommends that research be undertaken to establish the prevalence of E/H, and if the tests and treatments by clinical ecologists are demonstrably useful."

Comment - The Advisory Panel supports this, and suggests implementation through clinical research on a contract basis.

Recommendation 4 - "A survey should be undertaken, with the co-operation of these Ontario physicians who are members of the Society for Clinical Ecology and Environmental Medicine, to estimate the prevalence of E/H."

Comment - The Advisory Panel generally concurs with this, with the proviso that the Thomson report definition of E/H requires significant clarification before being used as a basis for estimating the prevalence. While considerable effort went into formulating this definition at the present time, it is imprecise enough that it will allow inclusion of many well known and defined multi-system disorders. Epidemiologists may find that the definition impedes research into E/H.

Recommendation 5 - "Research should include evaluations and random controlled clinical trials of existing and prospective diagnostic testing procedures by clinical ecologists."

Comment - The Advisory Panel strongly agrees with the need for scientific evaluation of the existing and prospective diagnostic testing procedures employed by clinical ecologists. We have suggested that contract research is the best mechanism for stimulating such research.

Recommendation 6 - "Research to be carried out in a multi-disciplinary investigative and therapeutic environmental unit, with funding for three years, followed by self-sustaining grants obtained in open competition."

Comment - The view of the Advisory Panel is that research should be carried out on a contract basis, and that a clear distinction between "investigation" and "therapy" is necessary both scientifically and fiscally - in the latter instance, research money cannot support clinical treatment. However, as previously noted, it is the view of the Panel, with substantial research experience, that viable research would require a minimum of five

to seven years. This is particularly true since the unit would require establishment "from the ground up". The Panel supports the recommendation for open competition at granting agencies, and that research be undertaken with the eventual aim of providing the necessary scientific basis towards the future establishment of a clinical unit.

Recommendations 7, 8, 9 and 10 - "The funding of tests and treatments - these four recommendations generally provide for initial or continued financial support for funding for a number of diagnostic tests and a fee schedule for the preparation of patient histories and counselling. Also included in this group of recommendations were a series of statements supporting the need for additional public funding for certain diagnostic and therapeutic techniques."

Comment - The Advisory Panel concluded that these four recommendations, which centre on providing funding for diagnosis and treatment, should be approached with caution. It was the view of the Panel that prior to changing the OHIP fee structure, appropriate research needs to be done validating the usefulness of any tests employed in the diagnosis and treatment of environmental hypersensitivity. As indicated in an earlier section of this review, the Advisory Panel recommends the establishment of a lay assessment committee, and that funding initially be obtained through the Ministries of Community and Social Services, and Housing. Once the concepts of clinical ecology have been scientifically validated, a review of the OHIP fee schedule should occur to recognize valid therapies.

The Advisory Panel concurred with the Ad Hoc Committee with respect to

recommendation #10, that certain procedures are not to be considered for inclusion in the overall funding, even under special consideration. The techniques covered in recommendation #10 included blood tests for Candida, Vega II machines, cytotoxic tests, and finally hair analysis.

Recommendation 11 - "Avoidance techniques and the prescription of nutritionally safe diets were dealt with in this recommendation, which gave limited and qualified support to the employment of these techniques and by implication to their funding."

Comment - The Advisory Panel concluded that there was not an adequate scientific base in most conditions to determine which factors should be avoided, or alternatively which factors influence the onset of E/H. The Advisory Panel was strongly of the opinion that additional research was necessary before supporting recommendation #11.

Recommendation 12 - "Vitamin and mineral supplements and uncontaminated food and water should not be included as insured health services."

Comment - The Advisory Panel concurred with this recommendation.

Recommendation 13 - "Nystatin should be financially supported when prescribed for proven Candida infections."

Comment - The Advisory Panel concurred with this recommendation, since the prescription of nystatin is part of current medical practice. However, the Panel felt that long-term prescriptions of nystatin should not be supported

until more is known about toxic levels and safety when used long-term.

Recommendation 14 - "The Thomson report does not recommend that the use of sublingual neutralization and intradermal neutralization be approved at this time as insured health services."

Comment - The Advisory Panel concurred with this recommendation.

Recommendation 15 - "The Thomson report does not recommend that the use of ketoconazole, transfer factor and vitamin C injections be supported at this time as insured health services."

Comment - The Advisory Panel concurred with this recommendation.

Recommendations 16 and 17 - "These two recommendations dealt with materials - extracts in particular - and indicated that they should be obtained from third-party sources. Furthermore, the cost per test and the maximum number of tests per year should be established.

Comment - The Advisory Panel concurred with these recommendations.

Recommendations 18, 19 and 20 - "Provide for public education with respect to E/H through the public health system, by medical officers of health and by physicians, together with a program of continuing education."

Comment - The Advisory Panel feels that these recommendations could be adequately handled by the lay committee and by publicizing the results of

research undertaken, once the investigation of the condition proceeds to the point where validity is established.

Recommendation 21 - "All basic social assistance programs should be reviewed to ensure recognition of how disabled some patients are."

Comment - Given the fact that the scientific evidence is not yet sufficiently developed, it would be appropriate that social assistance programs review their criteria and capacity to respond to this need as suggested by the Thomson report. It would be most useful if this review process took place within existing frameworks, but lead to a uniform set of support criteria.

Recommendation 22 - "Because administrators of social assistance programs have wide discretion, the environmental unit should provide expert assistance to appeal bodies such as the Social Assistance Review Board, and to those groups, such as the Community and Social Services Medical Advisory Board, that provide appeal bodies with expert advice."

Comment - In our reponses to the preceding recommendation, we emphasized the need for a uniform and fair set of criteria in assessing needs. The lay committee can provide unbiased assistance to the social agencies specified.

Recommendation 23 - "Physicians must have current information about environmental hypersensitivity, and must be willing to assess the patient's condition, irrespective of any diagnosis attached to it."

Comment - If and when mechanisms underlying these problems become apparent through research, then this information should be widely disseminated and the lay committee could be helpful in this regard.

Recommendation 24 - "Private insurers need to be encouraged to take the same approach in situations where there is a clear disability but some debate as to causation."

Comment - Private sector insurers need to deal with this problem, but are beyond the sphere of influence of the Advisory Panel. As stated previously, when research clarifies the nature and causes of this illness, then the private insurers must be encouraged to re-evaluate their position and respond to the need.

Recommendation 25 - "At least a portion of the costs associated with special diets and prescribed vitamin and mineral supplements should be claimable through existing food supplement programs and drug plans, under appropriate controls to avoid open-ended support."

Comment - When sufficient evidence has accumulated to support the usefullness of such treatments, then food supplement programs and drug plans can be modified, with appropriate criteria for eligibility.

(The Advisory Panel agrees with the Thomson report that changes should not be made to food supplement programs and drug plans before research is completed demonstrating whether and when such measures are effective.)

Recommendation 26 - "In cases of genuine financial need, (ie. people receiving social assistance) rent supplements should be available for those seeking to make modest environmental changes."

Comment - Where the request fits within the scope of existing programs, consideration should be given to rent supplements or discretionary payments. Since we do not envisage that research grants would bear the costs of diagnosis, testing and treatment, the true costs of such support should be gathered by the lay committee.

Recommendation 27 - "We recommend that the environmental unit collaborate with and assist those involved in the development of special housing programs."

Comment - Given our recommendation that it is premature to consider establishing an environmental unit, especially one to be funded through research grants, we would suggest instead that the lay committee participate actively in the consideration of special housing programs.

Recommendation 28 - "The establishment of an inter-disciplinary conference to discuss this report and its recommendations."

Comment - In the view of the Advisory Panel, the wide-spread distribution of the results of research would be one of the responsibilities of the lay committee, whose role would be that of stimulating an informed and qualified debate with respect to this controversial subject.

Recommendaton 29 - "That the OMA consider establishing an environmental health sub-section to bring together the practitioners interested in this field."

Comment - The Ontario Medical Association is beyond the sphere of influence of the Advisory Panel. As noted earlier, when research clarifies the nature and causes of this illness, then the OMA must be encouraged to re-evaluate their position and respond to the need.

Recommendation 30 - "The Thomson report recommends that the environmental unit develop recommendations for curriculum review committees, regarding possible curriculum changes in medical schools, to ensure that issues relating to environmental illness are part of medical education."

Comment - As stated previously, the Advisory Panel is of the view that basic research is necessary, establishing more clearly the nature and causes of environmental hypersensitivity. When this has been accomplished, changes in medical school curriculum will follow naturally.

FOREWORD TO APPENDIX

The Advisory Panel attempted to obtain information on the real cost of this illness, but this data was not available. We requested that members of the Department of Health Administration at the University of Toronto, attempt to analyse the submissions of the Thomson Committee towards an estimation of costs, the results of which appear in this Appendix.

Although the analysis suggests that the Ministry of Health is paying only a small part of the cost, there is not enough information to support this with certainty. This is the type of information which needs to be obtained through co-operation of the patients and the lay committee. The Appendix provides a model for data gathering and analysis.

APPENDIX I

COSTS OF ENVIRONMENTAL HYPERSENSITIVITY

An Estimate Based on Submissions to the Committee on Environmental Hypersensitivity

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Raisa Deber, Ph.D.

SUMMARY AND CONCLUSIONS

INTRODUCTION

The Ad Hoc Committee on Environmental Hypersensitivity Disorders presented its report to the Ontario government in August of 1985. A panel was formed shortly thereafter to review the Committee's conclusions and to investigate methods of implementing the recommendations made. The panel felt that it would be useful to obtain additional cost information on the disorders to use in the deliberations. This report provides two cost estimates for the panel:

(1) the self-reported costs of the disorders (for the variables coded) incurred by the individuals writing to the Thomson Committee, and

(2) the costs to the health insurance system as reported by these individuals. Limitations of the analysis are noted, and background data concerning the patients and their symptoms are also summarized.

METHOD

Data were gathered from over six hundred submissions made to the Committee on Environmental Hypersensitivities during the first half of 1985. These letters were sent to the committee in response to a notice placed in Ontario newspapers informing the public of the Committee's activities. This costing is based on the 119 letters which included information - often vague - concerning the costs incurred by 130

individuals, both adults and children. The costs reported in these letters represented the costs of each affected individual's entire history of the disorders, defined by the letter writer.

Costs were estimated using evidence contained in the submissions themselves, the April 1985 OHIP Schedule of Benefits, and the January 1985 Drug Benefit Formulary. Categories included were: visits to health professionals, tests, treatments, drugs and dietary changes, and environmental changes. Two costings were performed: the first costing involved total costs for all of the categories mentioned above, the second costed only those services for which re-imbursement from OHIP was available (i.e., physician visits, and tests).

RESULTS

Characteristics of the 130 individuals represented in this data file are displayed in Table I. Three-quarters are female, 80% are adults, and most reside in Southern Ontario. They reported a wide range of symptoms, with 100 having some sort of central nervous system disturbances. The 130 have reported symptoms anywhere from a year or less to 40 years, with a median of 8 years.

Few physicians other than general practitioners, clinical ecologists and allergists have been seen by the patients; however, it should be noted that letters were written largely by satisfied patients of clinical ecologists. Few other nontraditional health care practitioners were consulted. In the quest for treatment, most (104) saw their general practitioner at least once, with 47 paying many visits. Fifty-nine saw an

allergist. An assortment of other clinicians were seen by a minority of patients, particularly ENT specialists, psychiatrists, and internal medicine specialists.

Detailed results for each costing are presented in Table II. When all cost categories are taken into account, the 130 patients have incurred a bill of just over $2 million. The total average cost is close to $15,000 per individual, and the median cost is just under $8,000. The spread between the mean and the median cost indicates that most individuals' costs are relatively low, but that a few individuals faced very large costs - large enough to make average costs substantially higher. Reported total costs ranged from $460 to over $90,000.

OHIP funded services for these 130 individuals, however, totalled only about $67,000, with an average total cost of just over $500 per person. The median total cost in this case was just over $400, again indicating that a few individuals facing high costs have positively skewed the distribution of costs. One individual did not incur any expenses which were payable by OHIP; at the other extreme, another individual incurred costs of close to $2,700.

A complete discussion of the assumptions underlying the selection, coding, and costing procedures is appended.

LIMITATIONS OF THE ANALYSIS

1) The population under discussion is heterogeneous, including individuals with many and varied symptoms. As a result, costs to

individuals varied with the types of investigations and therapies undertaken. Future studies should clarify what subgroups of which population are under discussion.

2) The sample may not be (and is probably not) representative of all individuals in Ontario who have been investigated and treated for environmental hypersensitivity disorders. Being a self-selected sample, the group of individuals reported on here cannot be assumed to be representative of the group as a whole. The original Committee report discusses this aspect of the submissions. Most individuals who reported were clients of clinical ecologists, and were, with the exception of one individual in this group, very well pleased with the assistance which the clinical ecologist had been able to provide to them. Only one individual in this group was completely self-treated (i.e., had visited no health care practitioners), but there were not a large number of doctor shoppers. Anecdotally, these exist, but presumably they would be less likely to be among the satisfied customers and hence less likely to have entered our sample.

3) The costing information was extracted from correspondence which was not intended for that purpose. Relevant information is likely to be omitted, particularly for patients whose illness has been protracted. Biasing in the other direction, information may also be slightly exaggerated. Many of the letters are not intended to be accurate reports, but are emotional appeals for assistance. Descriptions of therapy, testing, etc., are also vague. For example, individuals reported having seen practitioners "many" or "countless" times. (Eventually the frequency 6 was assigned to "many".)

4) Variation in reporting style of the letter writers had to be taken into account when constructing the data file. In consequence, many of the categories are much too broad to enable a precise calculation of costs (for example, x-rays).

5) Much of the costing data had to be "questimated", although costs were based on patient report where possible. When the OHIP Schedule of Benefits was used, in many cases a representative cost had to be developed for a very broad category of tests (for example, for "blood test" or "x-ray"). This may have created a margin of error in our cost figures.

CONCLUSION

On the basis of the limitations described above, the results should be used very cautiously.

RECOMMENDATIONS FOR FUTURE RESEARCH

1. Sensitivity Analysis could be performed with the current data file by altering any disputed cost figures. As discussed in the more detailed section on method which has been appended, certain of the costs assigned are debatable. The panel might also wish to focus more closely on a particular section or subgroup of this data file, subject to the data limitations noted above.

2. If a more accurate and valid costing were desired, it would be necessary to employ a more rigorous methodology. The accuracy could be greatly improved through the use of a standard questionnaire developed for

this purpose. As well, given adequate time, costs could be verified through the health care practitioners used, and the patients. If the resouces were available, individuals could be asked to record their costs over a period of time. The effects of different methods of data capturing on response characteristics should be weighed (see, for example, Woodward, Chambers and Smith, A Guide to Improved Data Collection in Health and Health Care Surveys, The Canadian Public Health Association, 1982). We caution that interpreting the results from such a sample could prove difficult at this stage, because the disorders are heterogeneous, and may need to be further subdivided.

ENVIRONMENTAL HYPERSENSITIVITY COSTING

METHOD AND RESULTS

METHOD

The Committee received over six hundred submissions from individuals who identified either themselves or their children as experiencing disorders. Each of the 614 letters was read; 119 letters contained enough detailed information on diagnostic and treatment history to be coded and entered into a data base. Since some families identified more than one patient, the file includes data on a total of 130 individuals. The same individual performed all of the coding, so that consistent coding rules in the interpretation of the letters were used throughout.

For purposes of confidentiality, no names or other person-identifying information were used in the data file, although the letters were coded according to broad sociodemographic characteristics.

The submissions were also coded according to symptomatology, use of the health care system (i.e., visits to health professionals, testing and treatment undergone, and drugs and diet prescribed), as well as environmental changes made. Lost wage (or school) time which resulted from the disorders was also coded. Within these areas, the categories used were developed to be consistent with the Committee's original data base.

Items coded may be seen in Table I, along with the frequencies reported for each category coded. Sociodemographic information - gender, age, region of Ontario, occupation - requires no further elaboration. Categories for symptoms reported were adopted from the Committee's original data base and report. Reported visits to health professionals were divided into two categories: those visits for which the Ontario Health Insurance Program (OHIP) reimburses the physician in full, and those visits for which the physician or health care practitioner receives either no payment or only partial payment from OHIP for services. Tests, Treatment, and Drug and Diet categories were developed from the tabulations of the original data base.

The breadth of the categories in these sections arose because of the nature of the information provided in the letters, for example, "The doctor gave me the usual tests." was common (coded as G.P., non-specific) and was eventually assigned the value of blood and urine tests for the costing. Environmental changes which had been made, the number of years the individual had experienced the symptoms, and lost wage years were coded when possible to provide an indication of the personal, more qualitative, cost which was incurred by each individual.

1) Total Costs Incurred

Costs were developed for client visits, tests, treatments, drugs, and environmental changes made. The number of years an individual had experienced the symptoms was incorporated into the calculations of costs. Due to insufficient data, lost wage years were not used in the costing section.

i) Visits to Health Professional

Health professional visits counted were those that the patients attributed to their presumed environmental hypersensitivities - i.e., visits over and above normal doctor visits. Costs for physician visits were developed from the April, 1985 edition of the OHIP Schedule of Benefits. All dollar costs are thus to be taken as present day costs - they have not been adjusted on a time line even though many visits may have occurred in the past at lower prices (but were paid for from lower salaries).

Two cost figures were used for each specialty - an initial visit cost, and, if the client had reported more than one visit to a particular specialty, repeat visit costs. For each specialty, two sets of figures were available from the Schedule of Benefits: consultation and repeat consultation fees, or assessment and reassessment fees. We made the assumption that specialists were seen on a referral basis ("consultation") and general practitioners on a first contact basis ("assessment"). (See pages vi and vii of the Schedule of Benefits, items 1 and 2 for complete definitions.) What was felt appropriate for each case was chosen, for

example, cardiologist visits were costed on a consult-repeat consult basis, while visits to general/family practitioners were costed on an assessment-reassessment basis.

The only OHIP-reimbursed specialty which does not follow this pattern is the allergist visit category. Because the Royal College of Physicians and Surgeons has not set a standard for "allergy specialist", OHIP reimburses allergists according to their (other) area of specialization. Therefore a mean of assessment rates calculated from specialties indicated in the submissions and family practice rates was used to develop a set of figures for allergists.

Patient submissions were used as the source for costs for visits which were not reimbursed by OHIP. These costs were checked where possible with agencies representing their profession (for example, with the Acupuncture Foundation of Canada) and proved to be reliable.

Many individuals merely stated that they had seen a particular practitioner "many" times. For the purposes of this costing, many was taken as six - one initial visit and five repeat visits. Six visits were chosen because of fact validity and because submissions indicated that a normal schedule for the series of clinical ecological tests was six visits.

Costs used were as follows:

- from the April 1985 OHIP Schedule of Benefits -

Allergist:	Consult.	Rpt. Cons.	Assessment	Reassessment
specialist rates: (gastroenterology, clinical immunology internal medicine)	$86.70	$57.80	$44.30	$32.10
family practitioner rate	$41.60	$32.30	$39.00	$22.90
Use: mean			$41.65	$27.50

Cardiologist	Consult.	$86.70	Repeat Consult.	$57.30
Dermatologist	Consult.	$41.60	Repeat Consult.	$34.40
Family Practice	Assessment	$39.00	Reassessment	$22.00
Gastroenterologist	Consult.	$86.70	Repeat Consult.	$57.30
Obstet/Gynocologist	Consult.	$43.90	Repeat Consult.	$34.40
ENT	Consult.	$42.80	Repeat Consult.	$34.40
Immunologist	Consult.	$86.70	Repeat Consult.	$57.30
Neurologist	Consult.	$86.70	Repeat Consult.	$57.30
Paediatrician	Assessment	$86.70	Reassessment	$57.30
Psychiatrist	Consult.	$95.50	Repeat Consult.	$57.30
Other: Use:	First Visit	$86.70	Repeat Visits	$57.30

- from patient report -

Acupuncturist	total cost to patient:	$35.00 per session
Chiropractor	total cost to patient:	$25.00 per session
	coverage by OHIP:	$10.60 (physician only)
Clinical Ecologist	total cost to patient:	$55.00 per session
	coverage by OHIP:	$14.40 per session
Dentist	total cost to patient:	$60.00 per session
Dietician	total cost to patient:	$35.00 per session
Homeopath	total cost to patient:	$50.00 per session
Naturopath	total cost to patient:	$50.00 per session
Nutritionist	total cost to patient:	$35.00 per session
Psychologist	total cost to patient:	$70.00 per session
Other	total cost to patient:	$40.00 per session

ii) Tests

Test costs were also taken from the April 1985 OHIP Schedule of Benefits. For the OHIP reimbursed tests, the laboratory medicine schedule (L.M.S.) was used at the value given of $0.477 per L.M.S. unit. The 7 L.M.S. unit documentation and specimen handling charge was also added to tests, where applicable. In many cases, an estimate of some sort of representative cost has to be made because patient reports were not specific (i.e., "blood tests"). When specific tests were listed, precise costs were assigned. Clinical ecology testing costs were calculated from patient reports at $330.00 ($55.00 by six sessions).

Costs used were as follows:

- from the April 1985 OHIP Schedule of Benefits

g.p. unspecific	blood test + urine test (55 LMS units + 7 LMS units + 7 LMS units)	$32.91
anemia test	(hemoglobin) (25 LMS units + 7 LMS units)	$15.26
clinical ecology	(includes: intradermal, provocation, scratch, oral sublingual and unspecified tests) patient report ($55.00 each for 6 sessions)	$330.00
	OHIP coverage ($14.40 each for 6 sessions)	$86.40
blood	(55 LMS units + 7 LMS units)	$29.57
glucose tolerance	(30 LMS units + 3 LMS units + 7 LMS units)	$19.08
psychometric	(from patient report)	$125.00
thyroid	(50 LMS units + 80 LMS units + 7 LMS units)	$65.35
x-ray	use: abdomen/g.i. tract - estimate $25.00 technical + $22.00 professional	$47.00
other	(same as g.p. unspecified)	$32.91
allergy testing	basic fee of $3.90 added where "+" indicated	
	+ nasal	$3.60
	patch	$42.00
	+ bronchial provocation	$10.80
	+ skin	$30.50
	other and unspecified (mean of above)	$26.27

iii) Treatment

The treatment costs reported by these patients were not reimbursable by OHIP. Patient report was accordingly used in developing costs. Again, the assumption was made that a clinical ecological treatment regime would require six treatment sessions.

acupuncture	$40.00 per session X 6
avoidance	assign no monetary value
biofeedback	$30.00 per session X 6
meditation/self	assign no monetary value
neutralization/desensitization	$55.00 per session X 6
plant phenolics	$55.00 per session X 6
serum injections	$55.00 per session X 6
sublingual extracts	$55.00 per session X 6

iv) Drugs

The costs assigned to the reported frequencies for drug use also required construction of averages from broadly defined categories. Patient reported costs were used if available; otherwise, drug costs were developed from the January 1985 Drug Benefit Formulary (Number 20). From the Drug Benefit Formulary, the price of the drug which was reported most commonly used was chosen (or, if several drugs were reported commonly used, the least expensive of the group was chosen). When no most common drug was evident, averages of drug costs for that drug group were computed. The $5.00 dispensing fee was also added to prices taken from the Drug Benefit Formulary. For drugs and diet costs likely to be taken over a prolonged period of time, total costs were taken into account in one of two ways:

a) if a time period for the disorders was specified, by taking yearly costs and multiplying by number of years suffered, or

b) for other patients, by assuming one repeat prescription. This procedure tends to underestimate drug and diet supplement costs.

Drug and diet supplement costs used were as follows:

A) From patient report (if no number of years suffered indicated, assume one year).

diet	$150.00 extra expenditure/month X 12 months X number of years with disorders
desensitization extracts	$20.00/month X 12 months X number of years with disorders
Minerals/vitamins	$30.00/month X 12 months X number of years with disorders
nasal sprays	$10.00/month X 12 months X number of years with disorders
oxygen	$45.00/month X 12 months X number of years with disorders
vaginal creme /nystatin	$50.00/month X 12 months X number of years with disorders

B) Most representative cost (from Drug benefit Formulary No. 20)

antibotics	code 221678 (.2933 X 30 ml + $5.00 dispensing) X 2 prescriptions	$27.60
cortizone	code 249963 (.0980 X 100 + $5.00 dispensing) X 2 prescriptions	$29.60
inhalers	code 303569 ($8.85 + $5.00 dispensing) X 2 prescriptions	$27.70
laxatives	code 036218 $3.25 X 2 purchases (no dispensing fee)	$6.50
tranquilizers	code 013110 (.0320 X 100 + $5.00 dispensing) X 2 prescriptions	$16.40

C) Averages of categories (from Drug Benefit Formulary No. 20)

adrenalin	average of section 12.12 (4.2683 X 10 + $5.00 dispensing) X 2 prescriptions	$95.36
antihistamine	average section 4.00 (.5580 X 100 + $5.00 dispensing) X 2 prescriptions	$121.60
digestive enzymes	average digestants (.12936 X 100 + $5.00 dispensing) X 12 months X number of years with disorders	

v) Environmental Changes

Patient report was used to estimate costs for this category. No attempt was made to estimate the costs of those few individuals who received complete isolation, neither did any of the submissions provide comprehensive cost estimates for this result.

Costs used were as follows:

- from patient report -

isolation	ignore
move	$500.00
remove insulation (includes government rebate)	$1,000.00
heating system change	$1,500.00
remove rubber	$1,000.00
remove formaldehyde	$1,000.00
air filter	$130.00
respirator	$500.00

2) Patient Costs to the Ministry of Health

Three categories of costs represented costs incurred by the health insurance system:

a) fully reimbursed OHIP practitioner fees,

b) partially reimbursed OHIP practitioner fees, and

c) the OHIP reimbursed portion of testing costs. The rates we chose have been indicated in the cost lists for each category. No attempt was made to cost drug benefits as there was not enough information provided in the submissions to determine which clients were on government sponsored drug plans.

RESULTS

I) FREQUENCIES

Table I provides a listing of the frequencies for each category.

A) Sociodemographic Characteristics and Symptoms

In this group, females outnumbered males at a rate of three to one (75% to 25%), and adults outnumbered children four to one (80% to 20%). Not surprisingly, the majority of responses (accounting for 92% of the submissions) came from individuals in the southern, urban areas around Toronto, Hamilton-Niagara, and Ottawa, where the clinical ecologists practise. Just over half (57%) of the individuals reported their occupation. Individuals reported a wide range of symptoms, with the most prominent category being central nervous system problems. Three quarters of those reported headaches, depression, or general inability to cope. Many, of course, reported more than one category of symptoms.

B) Use of Health Care Services

Most, but not all, individuals saw at least one health care professonal for their problems; one individual saw no health care professionals at all. Most (80%) individuals saw their general practitioner at least once; a slightly larger percentage saw a clinical ecologist at least once (83). (This is probably accounted for by the fact that a large proportion of the letters were encouraged by clinical ecologists and that those individuals who saw clinical ecologists were more likely to have had their symptoms identified as being caused by environmental hypersensitivities and hence to have responded.)

In the OHIP reimbursed category, other frequently visited specialists included allergists, ENT (ear, nose, throat) specialists, psychiatrists, internal medicine specialists, and neurologists. Far fewer nonreimbursed or partially reimbursed health professionals were visited - clinical ecologists account for the largest number of visits, and the number of visits to the next most frequently used nonreimbursed health professional (naturopaths) was far below the rate of clinical ecologist use. The reader is referred to Table I for a full listing of other health professionals visited.

Most health care professionals were visited once. The large number of visits which are included in the "21 plus/many" category in the frequency count reflect the fact that a large proportion of the submissions merely indicated that they had visited a particular kind of health professional "many", or "countless" times. (As noted above, "many" was treated as six for the purpose of costing.) General practitioners received by far the largest number of repeat visits (as would be expected) although allergists, ENT's, and psychiatrists also received a substantial number as well. Of the non-OHIP reimbursed practitioners, only clinical ecologists, psychologists, and social workers received many repeat visits.

Most patients had clinical ecological testing performed, while many had (fully OHIP-reimbursable) allergy testing. Non-specific tests, blood tests, and x-rays also were used on some patients. Again, most underwent testing only once.

If drug and diet changes are not included, patients do not appear to have undergone a wide range of treatment. Most individuals attempted to avoid the substance which caused their symptoms, many received serum injections at the doctor's office, and a lesser number were administered sublingual drops or relied on their own remedies, (i.e., meditation, prayer). However, a wide range of drugs and diet changes and supplements were prescribed to those with symptoms of environmental hypersensitivity disorders, particularly diet changes (rotary diets, organic diets, or hypoglycemic diets), and vitamin and mineral supplements. Desensitization extracts, serum, and sublingual drops were the most commonly prescribed drugs for home use. Antibiotics, tranquilizers, and vaginal creams (mostly Nystatin) were the next largest groups of drugs prescribed.

C) Other Personal Costs

Of those who indicated the length of time they had suffered from the syndrome (and 22%) did not), there was no particular pattern to the number of years they had had the syndrome. Thirty-one percent of individuals had had the syndrome 21 years or longer, while 33% had had the syndrome 5 years or less, leaving 14% of the patients reporting as having had the syndrome for from 6 to 10 years. Five patients had been drastically affected, and reported having lived in total isolation for some period of time. Twenty-one had moved, changing their residence to a location which was more tolerable. Twenty-five percent had had air filters installed; 12% had converted to electric heat. Finally, 15 of the 26 who reported on their lost productivity time had lost from 1 to 2 years of work or school.

II) COSTS

The aggregate results of both costings are provided in Table II. Given the limitations of the data and the methodology discussed above, the costs represent - in 1985 dollars - 130 individuals' costs over the length of time each had the disorders.

1) Self-reported total costs incurred by the individual:

Within the grand total of over two million dollars worth of expenditures due to environmental hypersensitivity for this group of individuals, health care costs accounted for the greatest portion of the total costs incurred by all individuals (98%), with only 2% accounted for by environmental changes. As noted, this may reflect the fact that this ailment is heterogeneous and many in the sample had mild cases: only 60 out of 130, or 46%, reported having made any environmental changes. Because only 20% reported lost productivity time without indicating salaries, no costs were developed for this area. It should be noted that environmental changes and lost productivity were the only two which were unrelated to the health services industry. Because the data are scarce, conclusions about these costs should be treated with caution. Within the 98% of total costs accounted for by the use of the health care system, the greater portion of costs was due to testing, treatment, and drugs rather than to health professionals consultations.

A wide range of total costs was reported by this group of individuals ranging from $460 (for a female who experienced the disorders from the syndrome for twenty years), to over $90,000 (for a female who had

experienced the disorder for thirty years). The average total cost per individual is calculated at approximately $15,700. It should be noted that the median cost was just under $8,000, well below the mean cost. This indicates that a few individuals in this group had very high costs while most did not. Further verification is provided by the standard deviation which is of greater magnitude than the mean. This pattern holds for most of the cost categories.

Drugs and diet changes and supplements accounted for the largest portion of health care expenditures - at over $14,700 per individual on the average. Visits to health care practitioners followed. Costs incurred through the use of OHIP reimbursed and non-OHIP reimbursed practitioners were approximately equal, with most of the non-traditional health care visits coming from the clinical ecology category. (Average costs were $274 and $297 for OHIP reimbursed and nonreimbursed fees, respectively.) Environmental changes, treatment costs, and testing costs followed in magnitude of average cost. These averages are also displayed in Table II.

2) Patient Costs to the Ministry of Health

Costs to the Ministry of Health are much lower than the total costs incurred by the individuals. The total cost to the Ministry of Health for the 130 individuals reported on here was close to $67,000, just over three percent of the total costs incurred by all individuals.

OHIP reimbursed costs account for just over half (53%) of the total Ministry of Health costs. Costs due to visits to OHIP-reimbursed practitioners are identical to those in the previous analysis. Only a small percentage of the other practitioners visits are paid by OHIP; they only account for 15% of the total costs to the Ministry of Health (an average of just over $75 per individual). The remaining 32% of the costs were contained in the testing which individuals underwent, an average of over $160 per individual. The average of the total costs supported by the Ministry of Health for the 130 individuals was over $500 per individual. As with the previous analysis, the costs are positively skewed, with a few individuals with very high costs and a large group with lower costs.

TABLE AI

FREQUENCIES - ALL CATEGORIES

Report on 130 individuals - 9 familites - from 119

	Frequency	Percent
GENDER		
Male	33	(25%)
Female	97	(75%)
Total	130	(100%)
AGE		
Child/Adolescent (18)	25	(20%)
Adult (18+)	105	(80%)
Total	130	(100%)
REGION		
Southwest (London south)	5	(4%)
Central West (Hamilton-Niagara)	47	(36%)
Central East (Toronto area)	46	(35%)
East (Ottawa, Kingston, Brockville)	27	(21%)
Northeast	4	(3%)
Northest	0	(0%)
North	0	(0%)
Other (Saskatchewan)	1	(1%)
Total	130	(100%)
OCCUPATION		
Not indicated	56	(43%)
Non-labour force (esp. homemaker)	12	(9%)
Unemployed	12	(9%)
Un-semi-skilled (farm, clerical, sales and service)	16	(12%)
Craft and trade, small entrepreneur	1	(1%)
Foreman, supervisor	0	(0%)
Technician, scientific training	13	(10%)
Middle-management	8	(6%)
Semi-professionals	12	(9%)
Upper-managment/professionals	0	(0%)
Total	130	(99%) (rounding error)

TABLE AI - Page 2

SYMPTOMS	Frequency	Percent
Central Nervous System		
Tension		
Fatigue		
Headache		
Depression		
Inability to cope	100	(77%)
Gastrointestinal		
Abdominal Pain		
Bloating		
Heartburn, indigestion		
Constipation, Cramps		
Nausea, Vomiting		
Food Cravings		
Anorexia	57	(44%)
Respiratory		
Frequent Colds		
Bronchitis		
Congestion/Pain in Chest		
Asthma		
Shortness of breath	58	(45%)
Musculoskeletal		
Aches, Pains, Weakness of muscles		
Joint Pains, Backaches	43	(32%)
Genitourinary		
Premenstral Syndrome		
Vaginal Infections		
Bladder Infections		
Painful Urination, Enuresis	28	(22%)
Eye, Ear, Nose, Throat		
Sinus Infection		
Nasal Stuffiness		
Dizzyness		
Earaches		
Watering Eyes, Blurred Vision	52	(40%)
Skin		
Eczema, Dermatitis, Hives		
Flushing, Uticaria, Erythema	40	(30%)
Cardiovascular		
Hypertension		
Cardiac Arrhythmias		
Tachycardia	14	(11%)
Other	0	(0%)

TABLE AI - Page 3

	TOTAL	NUMBER REPORTED 1	2	3	4	5	6-10	11-20	21+ (+"many")
VISITS TO HEALTH PROFESSIONALS									
OHIP reimbursed									
Allergist	59	32	9	2	1	0	0	0	15
Cardiologist	5	4	1	0	0	0	0	0	0
Dermatologist	9	5	2	0	1	0	0	0	1
General Practitioner	104	31	10	4	6	1	3	2	41
Gastroenterologist	9	5	2	0	1	0	0	0	1
Gynaecologist	10	8	1	1	0	0	0	0	0
Ear, Nose, Throat	26	19	3	0	2	0	0	0	2
Internal Medicine	21	18	2	1	0	0	0	0	0
Neurologist	18	14	1	2	1	0	0	0	0
Paediatrician	11	5	1	0	0	0	0	0	5
Psychiatrist	24	11	4	1	1	0	0	0	7
Other	32	24	2	1	2	1	0	0	2
Nonreimbursed									
Acupuncture	7	1	0	0	0	0	1	0	3
Chiropracty	9	5	0	0	0	0	1	0	3
Clinical Ecology	108	16	0	0	2	1	2	1	86
Dentist	4	4	0	0	0	0	0	0	0
Dietician	2	2	0	0	0	0	0	0	0
Homeopath	2	2	0	0	0	0	0	0	0
Kinesiologist	0	0	0	0	0	0	0	0	0
Masseuse	1	0	0	0	0	0	0	0	1
Naturopath	12	9	1	0	0	0	0	0	2
Nutritionist	6	6	0	0	0	0	0	0	0
Psychologist/ Social Worker	9	5	1	0	1	1	0	0	1
Other	3	2	0	0	0	0	0	1	0
TESTS									
G.P., Unspecified	30	25	2	1	1	0	1	0	1
Anemia Test	2	2	0	0	0	0	0	0	0
Blood Test	29	22	1	5	0	1	0	0	0
Glucose Tolerance	10	9	1	0	0	0	0	0	0
Hepatitis Test	2	1	1	0	0	0	0	0	0
Mononucleosis	0	0	0	0	0	0	0	0	0
Psychometric Test	10	9	0	0	0	0	0	0	1
Thyroid Test	5	4	2	0	0	0	0	0	1
Ulcer Test	4	3	1	0	0	0	0	0	0
X-ray	20	11	2	3	1	0	0	0	3
Other	13	11	0	2	0	0	0	0	0

	# of Inds.		# of inds.
Allergy Tests:		Clinical Econolgy Tests:	
Nasal Test	2	Intradermal Test	2
Patch Test	6	Provocative Testing	13
Bronchial Provocation	1	Sublingual Drops	15
Skin Test	13	Scratch Test	0
Other	0	Oral Challenge	1
Unspecified	38	Unspecified	67

TABLE AI - Page 4

	Frequency	Percent
TREATMENT		
Acupuncture	2	2%
Avoidance	98	75%
Biofeedback	1	1%
Self Treatment/Meditation/prayer	25	19%
Neutralization/Desensitization	14	11%
Plant Phenolics	2	2%
Psychotherapy	2	2%
Serum (injections)	79	61%
Sublingual Extracts	27	21%
Other	4	3%
DRUGS AND DIET		
Adrenalin	2	2%
Antihistamine	17	13%
Antibiotics	27	21%
Cortizone	8	6%
Diet - Hypoglycemic, Rotary, Organic	107	82%
Digestive Enzymes	9	7%
Inhalers	8	6%
Laxatives	3	2%
Mineral and Vitamin Supplements	61	47%
Nasal Spray	2	2%
Oxygen	10	8%
Tranquilizers	22	17%
Vaginal Creme/Nystatin	25	19%
Other	16	12%
ENVIRONMENTAL CHANGES		
Isolation	5	4%
Move Residence	21	16%
Remove Insulation	3	2%
Heating System Change	16	12%
Air Filter	33	25%
Respirator	2	2%
Other	12	9%
YEARS WITH DISORDERS		
1 - 2 years	7	5%
3 - 5 years	37	28%
6 - 10 years	17	14%
11 - 15 years	11	8%
16 - 20 years	10	8%
21 + years	19	15%
not indicated	29	22%
LOST WAGES OR TIME AT SCHOOL		
1 - 2 years	15	
3 - 5 years	4	
6 - 10 years	0	
11 - 15 years	0	
16 - 20 years	1	
21+ years	6	

TABLE AII

TOTAL COSTS

Value ($ Canadian)

	TOTAL	MEAN	MEDIAN	STANDARD DEVIATION
PRACTITIONER VISITS				
Complete OHIP Funding	35,745.40	274.97	195.15	227.61
No/Partial OHIP Funding	38,700.00	297.69	330.00	227.64
TESTS	46,304.73	356.22	356.27	252.29
TREATMENT	41,190.00	316.85	330.00	250.66
DRUGS	1,829,646.44	14,074.20	6,480.00	17,527.69
ENVIRONMENTAL CHANGE	46,790.00	359.92	0.00	573.30
GRAND TOTAL	2,038,376.57	15,679.82	7,956.91	17,684.21

PATIENT COSTS TO THE MINISTRY OF HEALTH (130 patients)

PRACTITIONER VISITS				
Complete OHIP Funding	35,745.40	274.97	195.15	227.61
No/Partial Funding	9,810.70	75.47	86.40	64.39
TESTS	21,323.46	164.03	115.97	215.45
GRAND TOTAL	66,879.56	514.30	411.82	361.58

APPENDIX II

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